

Small States, Small Problems?

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Small states, no different from large states in income and growth, should receive the same policy advice large states do. Because of their greater openness, they may be more vulnerable to volatility in terms-of-trade shocks — but their openness pays off in growth.



Summary findings

Small states have attracted a good deal of research. Easterly and Kraay test whether microstates are any different from other states in income, growth, and volatility.

They find that, controlling for location, smaller states are actually richer than other states in per capita GDP. This income advantage largely reflects a productivity advantage — evidence against the idea that microstates are unable to exploit increasing returns to scale.

Small states do not have different per capita growth rates, with or without controls.

Their annual growth rates are more volatile, partly because of their greater volatility in responses to terms-of-trade shocks — to which they are exposed because of their greater openness. But on balance their greater openness pays off positively in growth.

Easterly and Kraay do recommend that small states diversify their risk by opening up more to international capital markets, although the benefits of doing so are still unresolved in the literature.

In general, they conclude, small states are no different from large states and should receive the same policy advice large states do.

This paper — a product of Macroeconomics and Growth, Development Research Group — is part of a larger effort in the group to study the needs of small states. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Kari Labrie, room MC3-456, telephone 202-473-1001, fax 202-522-1155, Internet address klabrie@worldbank.org. Policy Research Working Papers are also posted on the Web at <http://www.worldbank.org/html/dec/Publications/Workpapers/home.html>. The authors may be contacted at weasterly@worldbank.org or akraay@worldbank.org. June 1999. (36 pages)

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Small States, Small Problems?

William Easterly and Aart Kraay¹

The World Bank

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"Smallness is neither a necessary nor sufficient condition for slow economic development"

T.N. Srinivasan (1986)

"Economic storm clouds are gathering over paradise and the outlook is undeniably gloomy."

A.J. Dolman (1985)

Do small states suffer from their smallness? There are good theoretical reasons to believe that they do. The provision of public services may be subject to indivisibilities that lead to increasing returns to scale (Alesina and Spolaore 1997), especially fiscal institutions (Easterly and Rebelo (1993)) and defense (Kuznets (1960), Harden (1985)). Many theories of economic growth suggest increasing returns to scale in the private economy as well (Romer 1986, Barro and Sala-I-Martin 1995, Aghion and Howitt 1998), which may be difficult to realize in small states. Small economies may also be at a disadvantage because their size prevents them from diversifying into a wide range of activities, making them more vulnerable to terms of trade shocks than large states (Commonwealth Secretariat (1998)). Many small states suffer from poor location in that they are remote and/or landlocked, and many are located in regions prone to hurricanes and volcanic activity (Srinivasan (1986)). Public officials in small states may be much more likely to be subjected to conflicting pressures (Farrugia (1993)), and it may be difficult to recruit a high-quality civil service given the limited pool of candidates in small states (Streeten (1993)).

These potential difficulties facing small states have not been lost on policymakers or academics. Numerous conferences and seminars on the special difficulties of small states have been convened over the past forty years (Robinson (1960), Benedict (1967), Dobozi et. al. (1982), Commonwealth Consultative Group (1985, 1997), Small States Financial Forum (1987, 1988), Kaminarides et. al. (1989)). International organizations such as the United Nations have commissioned studies on the problems confronting small states for many years (United Nations (1971), Doumenge (1983)), and the United Nations has formally recognized the special difficulties of small states in a resolution to that effect (Briguglio (1995)). Titles of papers on small states (see our bibliography) frequently feature ominous terms and phrases such as "Problems", "Vulnerability", "Small is Dangerous", and even (twice) "Paradise Lost".

In this paper, we look for empirical evidence of alleged disadvantages of size by examining microstates with population 1 million or less. (We will use the terms "small states" and "microstates" interchangeably). If smallness is a disadvantage, then microstates must suffer with a vengeance. In particular, we would expect that microstates must on average be less

developed and grow less rapidly than larger states. In this paper, we test this hypothesis using cross-country data in a large sample that includes many microstates. In light of the grim predictions of theory, the picture of microstates which emerges from this analysis is somewhat surprising. After controlling for a range of factors, we find that microstates have on average higher income and productivity levels than small states, and grow no more slowly than large states. Per capita GDP growth rates are more volatile in microstates, due to their much greater exposure to international trade and fluctuations in their terms of trade. However, any growth disadvantages of this greater volatility are more than outweighed by the growth benefits of trade openness reaped by microstates by virtue of their necessarily large trade volumes. Finally, microstates are well-positioned to take advantage of opportunities international risk sharing, since the correlation of economic fluctuations in microstates with the world business cycles is surprisingly low.

These results contribute evidence in support of the growing view in the literature that small size might not be a disadvantage after all. Kuznets (1960) notes that small states also have advantages: primarily that many are lucky to have good natural resources and have a small and more cohesive populations which allows them to adapt better to change. Srinivasan (1986) and Streeten (1993) argue without systematic empirical evidence that small may also be beautiful. Using a sample of 48 countries Millner and Westaway (1993) fail to find evidence that the effect of a number of growth determinants varies with country size. Armstrong et. al. (1998) uses cross-sectional regressions covering a large number of small states and independent regions to argue that population size does not significantly affect growth, controlling for initial income and regional effects.

The remainder of this paper proceeds as follows. In the next section we document that small states are richer and have higher productivity levels than small states. In the following section we observe that small states suffer no obvious growth rate disadvantage, and attribute this to a number of offsetting advantages and disadvantages of small states. In Section 3 we document that although trade openness contributes significantly to the greater volatility of growth in microstates, this is not the whole story. In Section 4 we note that microstates are relatively well-positioned to take advantage of opportunities to diversify away their special risks since they currently are not particularly financially open and the shocks they receive are relatively uncorrelated with those experienced by the rest of the world. Section 5 offers concluding remarks.

1. Microstates and per capita income levels

In this paper, we consider a large cross section of 157 countries for which at least 10 years of annual data on per capita GDP adjusted for differences in purchasing power parity is available. Of these, 33 are microstates defined as having an average population over the period 1960-1995 of less than one million. These countries are listed in Table 1, and range in size from tiny St. Kitts and Nevis with population of 42,000 to Mauritius with 912,000. The income range is similarly wide, from very poor African countries such as Guineau-Bissau and Comoros with real PPP-adjusted per capita GDPs around \$600 to wealthy oil-exporting countries such as Qatar with per capita GDP of over \$18,000.

If microstates suffer from the disadvantages of smallness, they should be poorer on average than larger states. What do we actually find? Not controlling for any other characteristic, microstates have the same range of per capita incomes as the rest of the sample (Figure 1). However, if we control for the location by continent of all countries, whether they are oil producers, and whether they belong to the OECD, then microstates are actually significantly *richer* than other states (Regression 1). Microstates are 50 percent ($=\exp(.4025)-1$) richer than other states, controlling for location. We note that this result does not reflect the obvious outliers in the sample, since the oil exporting countries Qatar and Bahrain are picked up by the OIL dummy, and Luxembourg and Iceland are picked up by the OECD member dummy. Even if we exclude two other particularly wealthy microstates (Bermuda and Bahamas), we still find that microstates are nearly 40 percent richer than other states. Figure 2 shows the income residual by quintile of population, and we see the very strong income effect in the microstate bottom quintile of population. We also note that the favourable performance of small states carries over to other quality of life indicators. For example, if we in turn use under-five infant mortality and life expectancy at birth as the dependent variable in the above regression, we find that infant mortality is significantly lower in small states by 22 per thousand, while life expectancy is about four years higher. We are not sure why microstates are so much richer than their regional neighbours and have so much better human development indicators, but we see this as a decisive refutation of the macro arguments that microstates suffer from a development *disadvantage*.

Are microstates richer than others, controlling for location, because they save more or because they have a higher productivity level? We use the Mankiw-Romer-Weil (1992)

regression to answer this question. In the steady-state of the Solow model, output per person is given by:

$$(1) Y/L = A (s/(x+\delta+n))^{\alpha/(1-\alpha)}$$

where Y/L is output per person, A is the level of labor-augmenting productivity, s is the investment to GDP ratio, x is the rate of labor-augmenting productivity growth, δ is depreciation, n is population growth, and α is the share of capital income in GDP. We assume productivity growth of 2 percent and a depreciation rate of 7 percent. Following MRW, we take logs of both sides and regress the log of output per person on the same dummies as above (capturing continental and other productivity differences) and the log of the second multiplicative term in (1):

$$(2) \ln(Y/L) = \ln A + \alpha/(1-\alpha) [\ln s - \ln(x+\delta+n)]$$

We call this second term MRW, and the results of estimating this specification are in Regression 2. We find that small states' productivity advantage accounts for two-thirds of their income per capita advantage. Again this decisively refutes the notion that small states have a productivity disadvantage due to increasing returns to scale. We also refute the original MRW idea that productivity levels are the same across countries, as Asia and especially sub-Saharan Africa have significantly lower productivity than other regions. Once we allow the productivity level to vary, the coefficient on MRW implies a capital share of .28 -- which is in line with most estimates from national income accounting.

When we decompose MRW into its numerator and denominator from equation (1), we find that small states have significantly higher (log) investment rates -- see Regression 3 -- but not lower population growth rates (not shown). Hence, the one third of the small-state income effect in Regression 1 that is not attributable to productivity differences is attributable to higher investment in small states.

However, we should take with more than a grain of salt the result that investment accounts for even as much as one-third of the income advantage of small states. The significance of the MRW term in Regression 2 may reflect reverse causality -- richer states can afford to invest more and are usually thought to choose lower population growth than poor states. Or it may

reflect an omitted third factor, like incentive policies that affect both investment and income. One way of dealing with omitted third factors is to estimate equation 2 in changes. The results are not encouraging to the MRW explanation of income and growth. In Regression 4 we estimate the change in the MRW steady-state level using population growth and investment rates for 1960-70 and then 1985-95. The change in the MRW steady state levels does not explain the cross-country differences in growth rates over 1960-95. Figure 3 shows the variation in growth rates and in MRW steady state changes across small states. A view that all countries have the same productivity growth but have different long-run growth rates because of changes in steady state levels doesn't work in the data, either for small states or all states.

Moreover, the Solow/MRW sources of growth accounting implied in (2) sometimes gives unreasonable predictions. For example, figure 4 shows actual income in Guyana compared to Guyanese income assuming a constant productivity growth rate ($x=.02$) and allowing capital per person growth to evolve using actual investment rates and population growth.² The sources of growth exercise based on the Solow/MRW model cannot account for the boom in the 70s or for the collapse in the 80s. Nor can the sources of growth exercise based on the Solow/MRW model account for the negative growth in Guyana over the 40 years 1950-90. Capital growth per person was so rapid that Guyana should have had six times the income in 1990 that it actually had. Even if we assumed that productivity growth was at a lower bound estimate of 1 percent over 40 years (grey-shaded area), we still arrive at 4 times the actual income in 1990. Nor is there is a negative level shift of steady state income in Guyana, because the MRW change is barely different from zero (see the Guyana -GUY-- point in Figure 3). Clearly the assumption of a constant (and positive!) productivity growth rate is untenable for Guyana. But negative productivity growth does not make sense in the Solow/MRW framework if x is interpreted as technological progress - it's hard to believe that Guyana had technological regress. Nor does the Solow/MRW framework give us any explanation as to why productivity growth rates might differ across countries. We have to move outside of the model to recognize that capital growth sometimes does not pass into output growth as the Solow/MRW predicts. This only strengthens the presumption that income differences like the small state positive income differential have primarily to do with differing levels of A - however that is interpreted - and little to do with capital growth per person.

2. Microstates and Macro Growth

Even if the microstates do not have a disadvantage in levels, they may nevertheless grow more slowly over time. Several endogenous growth theories have a scale effect on per capita growth. Moreover, microstates exhibit greater output volatility which has negative effects on growth (Ramey and Ramey (1996)). Small states have the same range of growth experiences as other states (Figure 5), suggesting that there is no obvious scale effect for growth rates. There is also no growth difference for small states after controlling for continental location, oil, and OECD dummies, as shown in Regression 5.

As in other work, sub-Saharan Africa has lower growth than the rest of the world (Easterly and Levine 1997), and Asia has higher growth. However, there is no evidence that microstates either grow faster or slower than non-microstates

Why do small states not suffer any apparent growth disadvantages due to their small size? To answer this question, we consider a parsimonious cross-country growth regression which captures two of the factors prominent in the small states debate: openness to international trade measured as the share of imports and exports in GDP, and volatility measured as the annual standard deviation of growth rates within each country (Regression 6). We also include initial income to capture convergence effects, and secondary school enrollment rates as a measure of human capital. All of the non-dummy variables are significant of the expected sign: there is conditional convergence (negative coefficient on initial income), a positive effect of secondary enrollment and trade openness, and a negative effect of the standard deviation of annual growth.

This regression framework provides some useful clues as to why the microstate dummy is not significant in the basic regression 5. In particular, we can see from this regression that small states will have several offsetting advantages and disadvantages. They are richer than other countries controlling for continent dummies (see previous section) and hence will have slower growth than average by the conditional convergence effect. They have slightly higher secondary enrollment, which would give them higher growth, but the difference is not statistically significant (results not shown). Most important, microstates tend to have much higher trade shares (which is good for growth), offset by much higher volatility of growth rates (which is bad

² We follow the usual conventions, using the perpetual inventory method to calculate the capital stock and calculating the initial y/k as $(x+\delta+n)/s$ where n and s are average population growth and investment rates,

for growth).³ The insignificance of the microstate dummy therefore suggests that the negative effects of high initial income and high volatility are roughly offset by the positive effects of trade openness and better educational attainment.

In order to document the magnitude of these offsetting effects, we first need to know how different microstates are from non-microstates in terms of their trade volumes and volatility. We first document the well-known fact that microstates typically have much higher trade ratios than larger states, as illustrated by Regression 7. The consequences for openness of being a small state are truly remarkable. Small states have a ratio of trade to GDP that is 54 percentage points (1.2 standard deviations) higher than the average economy controlling for continent dummies! Second, real per capita GDP growth rates tend to be much more volatile in small states, as illustrated by Regression 8.⁴ In particular, the standard deviation of annual real per capita GDP growth is 1.4 percentage points higher in microstates than in non-microstates.

We have already shown that small states have higher income, which is a growth disadvantage because of the convergence effect. They also have higher secondary enrollment controlling for the usual dummies, which is a growth advantage, although the effect is not statistically significant. If the small state dummy is not significant in the overall growth regression (Regression 5 earlier), then the advantages and disadvantages of smallness must be roughly offsetting. Interestingly, the positive growth effect of openness ($0.012 \times 0.54 = 0.65$ percent) is 2.5 times larger than the negative growth effect ($-1.79 \times 0.014 = -0.25$ percent) of small states' greater output volatility. If output volatility is one of the consequences of openness (on which more below), this suggests that small states' greater openness is still on balance a positive factor for small states' growth. This finding is of particular interest, given the widely held view that small states suffer from their openness.⁵ Any source of growth volatility that is not related to openness, on the other hand, is detrimental to small states' growth.

In summary, there is no evidence that small states suffer any growth disadvantage from their small size. This finding can be explained by several offsetting advantages and

respectively, over the entire 40 year period.

³ The model of the aforementioned Alesina and Spolaore 1997 has the prediction that openness will make small states more viable.

⁴ In interesting historical footnote is that the greater volatility of small states has not always been accepted. Tarshis (1960) finds little evidence of a relationship between the coefficient of variation of per capita income and size across US states, and poses this as a puzzle.

disadvantages of small states. Although they are richer and experience more volatile shocks than non-microstates, they reap substantial growth advantages from their exposure to international trade.

Finally, it is interesting to note that one often-heard benefit of microstates does not appear to be empirically very important. It is often argued that one of the advantages of microstates is that they tend to be ethnically very homogeneous, which may make it easier for such states to forge the political consensus required to adjust to a changing environment (for example, Kuznets (1960)). Easterly and Levine (1997) and Alesina, Baqir, and Easterly (1999) find that measures of ethnic fractionalization are associated with a lower level of public goods provision and lower growth. However, the mean value of the ethnolinguistic indicator of ethnic diversity among those microstates for which data is available is insignificantly different from that among non-microstates, suggesting that the benefits of homogeneity may not be especially pronounced for microstates.

3. Openness and Volatility

In the previous Section we saw that microstates reap growth benefits from their openness to international trade, but suffer growth costs due to their greater volatility of growth rates. In this section we consider in more detail the relationship between trade openness and volatility in microstates. A significant portion of the growth rate volatility experienced by small states can be attributed to volatility in their terms of trade, but this is not the entire story. Even after controlling for terms of trade volatility, growth rates in microstates are significantly more volatile than in non-microstates.

We note first that the volatility of terms of trade shocks experienced by microstates is much greater than for larger states. We define terms of trade shocks as the growth in the local currency price of exports times the share of exports in GDP less the growth in the local currency price of imports less the share of imports in GDP, which captures both the magnitude of price fluctuations (changes in export and import prices) and their importance for the domestic economy (weighted by the shares of exports and imports in GDP). We then regress the standard deviation of this measure of terms of trade shocks on the same set of regional dummies as before, dummy

⁵ This view of small states dates back at least to Scitovsky (1960). Dolman (1985) goes so far as to suggest that many small island states would be better off reverting to autarkic subsistence economies.

variables to capture oil exporters and commodity exporters who are more likely to suffer extreme fluctuations in their terms of trade, and the microstate dummy (Regression 9). We find that there is a highly significant microstate effect, with the standard deviation of terms of trade shocks larger by 0.013 (or about one-third of one standard deviation of the dependent variable) in microstates.

This terms of trade volatility might be due to two factors. First, we have already seen that the share of trade in GDP is especially large in microstates, and this may contribute to the magnitude of our measure of terms of trade shocks (since it weights changes in import and export prices by the shares of imports and exports in GDP). Second, microstates' exports are likely to be more specialized than those of large states, both in terms of products exported and in terms of export markets (Kuznets (1960), Knox (1967), Armstrong and Read (1998)). The distinction between these factors is important because there is little that microstates can do about their overall trade volumes – autarky is simply not an option for small states that produce a much narrower range of goods and services than they consume, and moreover we have already documented the substantial growth benefits accruing to small states due to their openness. If in contrast the greater volatility of growth is due to excessive reliance on a few export products and a few export markets, then policies designed to help diversify exports may help to dampen economic fluctuations.

We can get a rough idea of the relative importance of these two factors by redefining the terms of trade shock as the *unweighted* difference between the growth in export prices and the growth in import prices. When we use this alternative measure of terms of trade shocks as the dependent variable in Regression 9, we find that the microstates dummy is negative and insignificant (Regression 10). That is, the volatility of changes in the price of exports relative to imports are if anything *lower* in microstates relative to larger states. Although this is not conclusive evidence, it does cast doubt on the notion that microstates are especially vulnerable to external shocks simply because their international trade is more specialized. Rather, the greater volatility of terms of trade shocks in microstates is primarily due to their unavoidably large trade shares.

Finally, it is worth noting that greater volatility of growth in microstates is not solely due to their greater susceptibility to terms of trade shocks. To illustrate this point, we re-estimate Regression 8, but include the volatility of the terms of trade as an explanatory variable

(Regression 11). We find that the microstate dummy remains significant even after controlling for the effect of greater terms of trade volatility on the volatility of overall growth. This additional volatility may be due to several factors. Many of the microstates in our sample are located in areas prone to natural disasters such as hurricanes, and the higher growth volatility in small states may simply reflect the devastating effect of these natural forces. However, it is also possible that some of this observed volatility reflects difficulties in measuring per capita incomes, which may be particularly acute in small states where statistical institutions may be weaker than average.

4. Opportunities for Diversification

In the previous section we have seen that microstates experience much more volatile growth rates than non-microstates. This in part reflects their greater vulnerability to terms of trade shocks, and also the tendency of many microstates to suffer heavily from natural disasters. In this section we briefly consider the potential of small states to mitigate the adverse effects of this largely-unavoidable volatility by sharing risks with the rest of the world.

One of the potential benefits of financial openness is that it allows countries to share risks with the rest of the world, by holding claims on assets located outside their borders whose returns are not perfectly correlated with returns to domestic assets. The magnitude of these benefits depends on how volatile are shocks to the domestic economy, and the extent to which they are uncorrelated with shocks abroad. Small states are particularly well-situated to benefit from such risk sharing arrangements, for two reasons. First, small states suffer large shocks, as documented in Section 3. Second, in contrast to the often-heard view that small states are particularly susceptible to cyclical fluctuations in large states, we find that the shocks experienced by small states are not unusually correlated with the world business cycle. We illustrate this point with Regression 12, which regresses the correlation of per capita GDP growth in a country with OECD average real per capita GDP growth on the same set of dummies as before, as well as the logarithm of average per capita GDP (to capture the stylized fact documented by Kraay and Ventura (1998) that business cycles in poorer countries tend to be less correlated with the world average cycle), and a microstate dummy. The microstate dummy is insignificant, suggesting that microstates are not unusually correlated with the OECD cycle. However, it is important to note that growth rates in neighbouring microstates may be highly correlated, especially to the extent that growth rate volatility reflects natural disasters such as hurricanes. This suggests that regional

arrangements to share risk among microstates will be much less valuable than pooling risks with a wider range of countries.

Despite the potential benefits of risk sharing through participation in international financial markets, microstates do not appear to be especially open financially. We illustrate this with Regressions 13-14, which regress two alternative measures of financial openness on a set of regional dummies as well as the logarithm of average per capita income. In Regression 13 the dependent variable is the fraction of years for which data is available in which the IMF reports restrictions on capital account transactions in that country.⁶ The coefficient on the microstate dummy is positive, although insignificantly so. This suggests that microstates are not particularly open to financial flows, as measured by legal impediments to such flows. Combining this observation with the empirical results of Lewis (1995), who finds that consumption risks are less diversified in countries with this measure of capital controls, this suggests that microstates are not taking full advantage of the opportunities for risk diversification afforded by international capital markets. The outcome measure of financial openness paints a somewhat more favourable picture, as the microstate dummy is positive and statistically significant at conventional levels. This suggests that the volume of capital flows is slightly larger for microstates than for non-microstates, although the magnitude of this effect is small – only about 2 percentage points of GDP. Overall, this evidence suggests that microstates are not as financially open as they might be given the high volatility they face, and hence are not fully exploiting opportunities for international risk diversification.

We conclude this section with the observation that although greater financial openness may help microstates insure against the large shocks they receive, financial openness is itself no panacea. Grilli and Milesi-Ferretti (1995) and Rodrik (1998) both note that there is no evidence that financially-open economies grow faster or enjoy higher investment rates. On the other hand, there is also no systematic evidence in favor of the popular view that by opening up financially, countries expose themselves to greater volatility due to the vagaries of international financial markets (Kraay (1998)). In summary, although financial openness may provide a valuable means for small states to diversify some of the large risks they face, existing evidence does not support the view that there will be a large growth payoff from such policies.

⁶ As reported in the Annual Report on Exchange Arrangements and Exchange Restrictions. The disadvantages of this measure are well-known. First, it captures only the presence, and not the intensity of controls. Second, it captures only controls on residents, and not on non-residents, although there is some presumption that these two types of controls are correlated across countries.

5. Conclusions

Our analysis suggests that small states have perhaps received excessive attention from the literature – notwithstanding our own addition to the literature!--as special cases calling for special policy measures. We find that microstates have, if anything, significantly *higher* per capita income than others in their region. There is no significant difference in growth performance between large and small states. It is true that growth volatility and volatility of terms of trade shocks as percent of GDP is higher in small states, but this is due entirely to their greater trade openness – and the net benefits of openness on growth are positive. The one missing piece in the current situation of microstates is that they are not fully exploiting the potential to diversify their risks by opening up to international capital movements. But even the payoff to filling in this last missing piece is unclear from evidence in the literature.

This is not to say that microstates are free of economic problems! Many microstates are still poor, and promoting growth out of that poverty is as important as it is in other poor countries. The good news is that the lessons of experience from all countries are applicable to small states, so they can benefit from the large amount of cross-country evidence on the determinants of long-run growth.

Tables and Figures

Table 1 – Small States

		Population (Thousands)	Average Per Capita GDP, 1985 PPP-Adjusted Dollars
ATG	Antigua and Barbuda	63	5329
BHR	Bahrain	419	10342
BHS	Bahamas, The	237	11136
BLZ	Belize	178	3548
BMU	Bermuda	58	15356
BRB	Barbados	247	5341
BWA	Botswana	880	1516
COM	Comoros	340	632
CPV	Cape Verde	295	746
CYP	Cyprus	638	5084
DJI	Djibouti	344	1479
FJI	Fiji	602	3149
GAB	Gabon	777	3853
GMB	Gambia, The	628	803
GNB	Guinea-Bissau	739	644
GRD	Grenada	92	2632
GUY	Guyana	719	1630
ISL	Iceland	223	9689
KNA	St. Kitts and Nevis	42	4399
LCA	St. Lucia	148	3264
LUX	Luxembourg	358	11934
MDV	Maldives	201	1908
MLT	Malta	341	4049
MUS	Mauritius	916	4092
QAT	Qatar	384	18278
REU	Reunion	496	2253
SLB	Solomon Islands	299	1845
SUR	Suriname	378	2877
SWZ	Swaziland	556	2358
SYC	Seychelles	59	2214
VCT	St. Vincent and the Grenad	107	3312
VUT	Vanuatu	145	1633
WSM	Samoa	160	1844

Regression 1

Dependent Variable: log of average income 1960-95

Method: Least Squares

Included observations: 157

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SMALLSTATE	0.402504	0.108228	3.588670	0.0005
ASIA	7.517973	0.111549	52.12283	0.0000
AFRICA	6.691796	0.085404	81.37846	0.0000
WESTERN	7.932229	0.098881	85.54604	0.0000
HEMISPHERE				
MIDDLE EAST & N.	7.863013	0.169759	45.58837	0.0000
AFRICA				
EUROPE &	8.100983	0.116053	76.49556	0.0000
CENTRAL ASIA				
OIL	0.814728	0.178268	4.900633	0.0000
OECD	1.168653	0.148174	9.309253	0.0000
R-squared	0.708909	Mean dependent var	7.855922	
Adjusted R-squared	0.695233	S.D. dependent var	0.982946	

Regression 2

Dependent Variable: log of average income 1960-95

Method: Least Squares

Included observations: 139

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ASIA	7.438718	0.142546	52.18481	0.0000
EUROPE & CENTRAL ASIA	7.714671	0.133412	57.82584	0.0000
WESTERN HEMISPHERE	7.800517	0.094056	82.93488	0.0000
MIDDLE EAST & N. AFRICA	7.763342	0.143795	53.98906	0.0000
OECD	1.122059	0.113640	9.873815	0.0000
OIL	0.691713	0.150642	4.591781	0.0000
AFRICA	6.865222	0.093269	73.60652	0.0000
SMALLSTATE	0.267340	0.132294	2.020799	0.0454
MRW	0.389346	0.101618	3.831453	0.0002
R-squared	0.761487	Mean dependent var	7.795722	
Adjusted R-squared	0.746809	S.D. dependent var	0.994449	

Regression 3

Dependent Variable: Log of average investment rate/GDP (PPP) 60-95

Method: Least Squares

Included observations: 139

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ASIA	-1.867634	0.117983	-15.82967	0.0000
AFRICA	-2.581324	0.117818	-21.90938	0.0000
WESTERN HEMISPHERE	-1.968057	0.072648	-27.09038	0.0000
MIDDLE EAST & N. AFRICA	-2.064563	0.158454	-13.02945	0.0000
EUROPE & CENTRAL ASIA	-1.493982	0.084612	-17.65692	0.0000
OIL	0.137961	0.160770	0.858126	0.3924
OECD	0.198926	0.098043	2.028980	0.0445
SMALLSTATE	0.381396	0.107068	3.562201	0.0005
R-squared	0.440238	Mean dependent var	-1.956707	
Adjusted R-squared	0.410327	S.D. dependent var	0.680181	

Regression 4

Dependent Variable: Average per capita growth 1960-95

Method: Least Squares

Included observations: 133

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.018962	0.001613	11.75912	0.0000
DMRW6095	0.003758	0.002847	1.319799	0.1892
R-squared	0.013122	Mean dependent var	0.019050	
Adjusted R-squared	0.005589	S.D. dependent var	0.018633	

Regression 5

Dependent Variable: Average per capita growth 1960-95

Method: Least Squares

Included observations: 154

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ASIA	0.026679	0.004888	5.457927	0.0000
AFRICA	0.006639	0.002874	2.310184	0.0223
WESTERN HEMISPHERE	0.016090	0.002569	6.263201	0.0000
MIDDLE EAST & N. AFRICA	0.018039	0.006376	2.829106	0.0053
EUROPE & CENTRAL ASIA	0.020941	0.004848	4.319413	0.0000
OIL	-0.014381	0.007439	-1.933011	0.0552
OECD	0.006522	0.004430	1.472347	0.1431
SMALLSTATE	0.002222	0.004983	0.445971	0.6563
R-squared	0.195323	Mean dependent var		0.016336
Adjusted R-squared	0.156743	S.D. dependent var		0.021323

Regression 6

Dependent Variable: Average per capita growth 1960-95

Method: Least Squares

Included observations: 130

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ASIA	0.137565	0.024502	5.614343	0.0000
AFRICA	0.117585	0.023412	5.022435	0.0000
WESTERN HEMISPHERE	0.134214	0.026701	5.026535	0.0000
MIDDLE EAST & N. AFRICA	0.137746	0.024181	5.696354	0.0000
EUROPE & CENTRAL ASIA	0.136707	0.025164	5.432535	0.0000
OIL	-0.000407	0.004736	-0.085912	0.9317
OECD	0.009192	0.005901	1.557607	0.1220
LQIN60	-0.017360	0.003702	-4.689944	0.0000
SECONDARY ENROLLMENT 60-95	0.000342	0.000111	3.069972	0.0027
Share of Trade in GDP 60-95	0.012076	0.002746	4.397740	0.0000
Standard Deviation of Growth 60-95	-0.179370	0.082047	-2.186187	0.0308
R-squared	0.535076	Mean dependent var	0.016972	
Adjusted R-squared	0.496006	S.D. dependent var	0.019612	

Regression 7

Dependent Variable: Share of Trade in GDP 60-95

Method: Least Squares

Included observations: 158

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ASIA	0.657933	0.128117	5.135396	0.0000
AFRICA	0.522459	0.042598	12.26481	0.0000
WESTERN HEMISPHERE	0.613623	0.063168	9.714153	0.0000
MIDDLE EAST & N. AFRICA	0.698416	0.081605	8.558546	0.0000
EUROPE & CENTRAL ASIA	0.788507	0.059614	13.22688	0.0000
OIL	0.145042	0.094684	1.531846	0.1277
OECD	-0.178562	0.077809	-2.294883	0.0231
SMALLSTATE	0.538525	0.070860	7.599897	0.0000
R-squared	0.285557	Mean dependent var	0.739223	
Adjusted R-squared	0.252217	S.D. dependent var	0.436784	

Regression 8

Dependent Variable: Standard Deviation of Growth 60-95

Method: Least Squares

Included observations: 154

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ASIA	0.047770	0.002558	18.67561	0.0000
AFRICA	0.061945	0.002457	25.21095	0.0000
WESTERN HEMISPHERE	0.049090	0.002689	18.25762	0.0000
MIDDLE EAST & N. AFRICA	0.060996	0.006357	9.595790	0.0000
EUROPE & CENTRAL ASIA	0.055067	0.004943	11.14022	0.0000
OIL	0.015740	0.004851	3.244719	0.0015
OECD	-0.025540	0.004311	-5.924337	0.0000
SMALLSTATE	0.014339	0.003346	4.285854	0.0000
R-squared	0.467655	Mean dependent var	0.055809	
Adjusted R-squared	0.442131	S.D. dependent var	0.021426	

Regression 9

Dependent variable: Standard Deviation of Terms of Trade Shocks 1960-95
 Number of observations: 114

Mean of dep. var. = .038019	LM het. test = 1.87192 [.171]
Std. dev. of dep. var. = .021479	Durbin-Watson = 2.07124
[<.869]	
Sum of squared residuals = .026595	Jarque-Bera test = 2.17388 [.337]
Variance of residuals = .250897E-03	Ramsey's RESET2 = .137189 [.712]
Std. error of regression = .015840	F (zero slopes) = 14.5415 [.000]
R-squared = .489871	Schwarz B.I.C. = -8.03086
Adjusted R-squared = .456183	Log likelihood = 314.945

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
SSA	.042971	.419929E-02	10.2330	[.000]
ASIA	.022997	.323085E-02	7.11797	[.000]
ECA	.016725	.219593E-02	7.61616	[.000]
MENA	.039738	.690534E-02	5.75471	[.000]
LAC	.037033	.317373E-02	11.6685	[.000]
OIL	.023363	.503847E-02	4.63685	[.000]
COMMOD	.740058E-02	.452971E-02	1.63379	[.105]
MICROSTATE	.013328	.473321E-02	2.81585	[.006]

Standard Errors are heteroskedastic-consistent (HCTYPE=2).

Regression 10

Dependent variable: Standard Deviation of Unweighted Terms of Trade Shocks
1960-95

Number of observations: 114

Mean of dep. var. = .126255	LM het. test = 3.77342 [.052]
Std. dev. of dep. var. = .072712	Durbin-Watson = 2.36931 [<.997]
Sum of squared residuals = .314207	Jarque-Bera test = 3.85662 [.145]
Variance of residuals = .296422E-02	Ramsey's RESET2 = .084551 [.772]
Std. error of regression = .054445	F (zero slopes) = 13.6498 [.000]
R-squared = .474073	Schwarz B.I.C. = -5.56154
Adjusted R-squared = .439342	Log likelihood = 174.193

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
SSA	.146951	.011390	12.9012	[.000]
ASIA	.094062	.011595	8.11254	[.000]
ECA	.046957	.553333E-02	8.48622	[.000]
MENA	.138424	.029647	4.66910	[.000]
LAC	.140449	.014181	9.90428	[.000]
OIL	.074365	.023821	3.12183	[.002]
COMMOD	.023068	.012845	1.79589	[.075]
MICROSTATE	-.011439	.011375	-1.00558	[.317]

Standard Errors are heteroskedastic-consistent (HCTYPE=2).

Regression 11

Dependent variable: Standard Deviation of Real Per Capita GDP Growth 1960-1995
 Number of observations: 114

Mean of dep. var. = .052993	LM het. test = .058422 [.809]
Std. dev. of dep. var. = .021039	Durbin-Watson = 1.82486 [<.466]
Sum of squared residuals = .023269	Jarque-Bera test = 7.39687 [.025]
Variance of residuals = .221607E-03	Ramsey's RESET2 = .325584E-02 [.955]
Std. error of regression = .014886	F (zero slopes) = 15.0879 [.000]
R-squared = .534787	Schwarz B.I.C. = -8.12293
Adjusted R-squared = .499342	Log likelihood = 322.561

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
SSA	.045460	.524191E-02	8.67245	[.000]
ASIA	.037674	.424625E-02	8.87235	[.000]
ECA	.028505	.330153E-02	8.63375	[.000]
MENA	.046493	.842420E-02	5.51904	[.000]
LAC	.034650	.462190E-02	7.49686	[.000]
OIL	.012151	.580664E-02	2.09255	[.039]
COMMOD	.709771E-02	.396159E-02	1.79163	[.076]
MICROSTATE	.020540	.518460E-02	3.96181	[.000]
Standard	.249983	.105027	2.38017	[.019]

Deviation Of

Terms of Trade

Standard Errors are heteroskedastic-consistent (HCTYPE=2).

Regression 12

Dependent variable: Correlation of Real Per Capita GDP Growth with OECD
Average Real Per Capita GDP Growth, 1960-95

Number of observations: 155

Mean of dep. var. = .246648	LM het. test = .866619 [.352]
Std. dev. of dep. var. = .267756	Durbin-Watson = 1.95295 [<.711]
Sum of squared residuals = 7.23486	Jarque-Bera test = .769712 [.681]
Variance of residuals = .049896	Ramsey's RESET2 = .034630 [.853]
Std. error of regression = .223373	F (zero slopes) = 8.47520 [.000]
R-squared = .344712	Schwarz B.I.C. = -2.73913
Adjusted R-squared = .304039	Log likelihood = 17.5644

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
SSA	-.717189	.199481	-3.59529	[.000]
ASIA	-.712958	.231572	-3.07877	[.002]
ECA	-.638812	.239380	-2.66861	[.008]
MENA	-.822765	.233648	-3.52138	[.001]
LAC	-.692913	.232984	-2.97408	[.003]
OECD	.082437	.068673	1.20043	[.232]
LOGQAV6095	.119230	.029067	4.10185	[.000]
OIL	-.077165	.065326	-1.18123	[.239]
COMMOD	.026310	.057571	.456996	[.648]
MICROSTATE	.013354	.053808	.248181	[.804]

Standard Errors are heteroskedastic-consistent (HCTYPE=2).

Regression 13

Dependent variable: Fraction of Years in Which Capital Controls in Place, 1960-1995

Number of observations: 139

Mean of dep. var. = .787387	LM het. test = 12.2811 [.000]
Std. dev. of dep. var. = .342953	Durbin-Watson = 2.03770 [<.867]
Sum of squared residuals = 11.7237	Jarque-Bera test = 35.1819 [.000]
Variance of residuals = .090881	Ramsey's RESET2 = 2.65476 [.106]
Std. error of regression = .301465	F (zero slopes) = 5.51078 [.000]
R-squared = .277703	Schwarz B.I.C. = -2.11787
Adjusted R-squared = .227311	Log likelihood = -25.3683

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
SSA	2.09580	.328127	6.38717	[.000]
ASIA	2.06680	.375284	5.50729	[.000]
ECA	2.39422	.403090	5.93967	[.000]
MENA	2.13384	.384726	5.54640	[.000]
LAC	2.08108	.393251	5.29200	[.000]
OECD	-.149049	.100129	-1.48857	[.139]
COMMOD	.541426E-02	.062675	.086386	[.931]
OIL	-.097368	.115647	-.841936	[.401]
LOGQAV6095	-.170939	.049805	-3.43213	[.001]
MICROSTATE	.025574	.080311	.318431	[.751]

Standard Errors are heteroskedastic-consistent (HCTYPE=2).

Regression 14

Dependent variable: Average Capital Inflows Plus Capital Outflows as a Fraction of GDP, 1960-95

Number of observations: 132

Mean of dep. var. = .062080	LM het. test = 12.0349 [.001]
Std. dev. of dep. var. = .058247	Durbin-Watson = 2.03507 [<.866]
Sum of squared residuals = .329045	Jarque-Bera test = 111.565 [.000]
Variance of residuals = .269709E-02	Ramsey's RESET2 = .463370 [.497]
Std. error of regression = .051933	F (zero slopes) = 4.75418 [.000]
R-squared = .259653	Schwarz B.I.C. = -5.62445
Adjusted R-squared = .205037	Log likelihood = 208.328

Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
SSA	-.109303	.089036	-1.22763	[.222]
ASIA	-.123786	.091137	-1.35824	[.177]
ECA	-.126912	.102485	-1.23834	[.218]
MENA	-.116162	.103124	-1.12643	[.262]
LAC	-.153697	.104193	-1.47512	[.143]
OECD	.016410	.028921	.567432	[.571]
COMMOD	-.013906	.011405	-1.21930	[.225]
OIL	-.027007	.015827	-1.70637	[.090]
LOGQAV6095	.023934	.013285	1.80152	[.074]
MICROSTATE	.027312	.013028	2.09646	[.038]

Standard Errors are heteroskedastic-consistent (HCTYPE=2).

Figure 1: Per capita income and population size, averages 1960-95

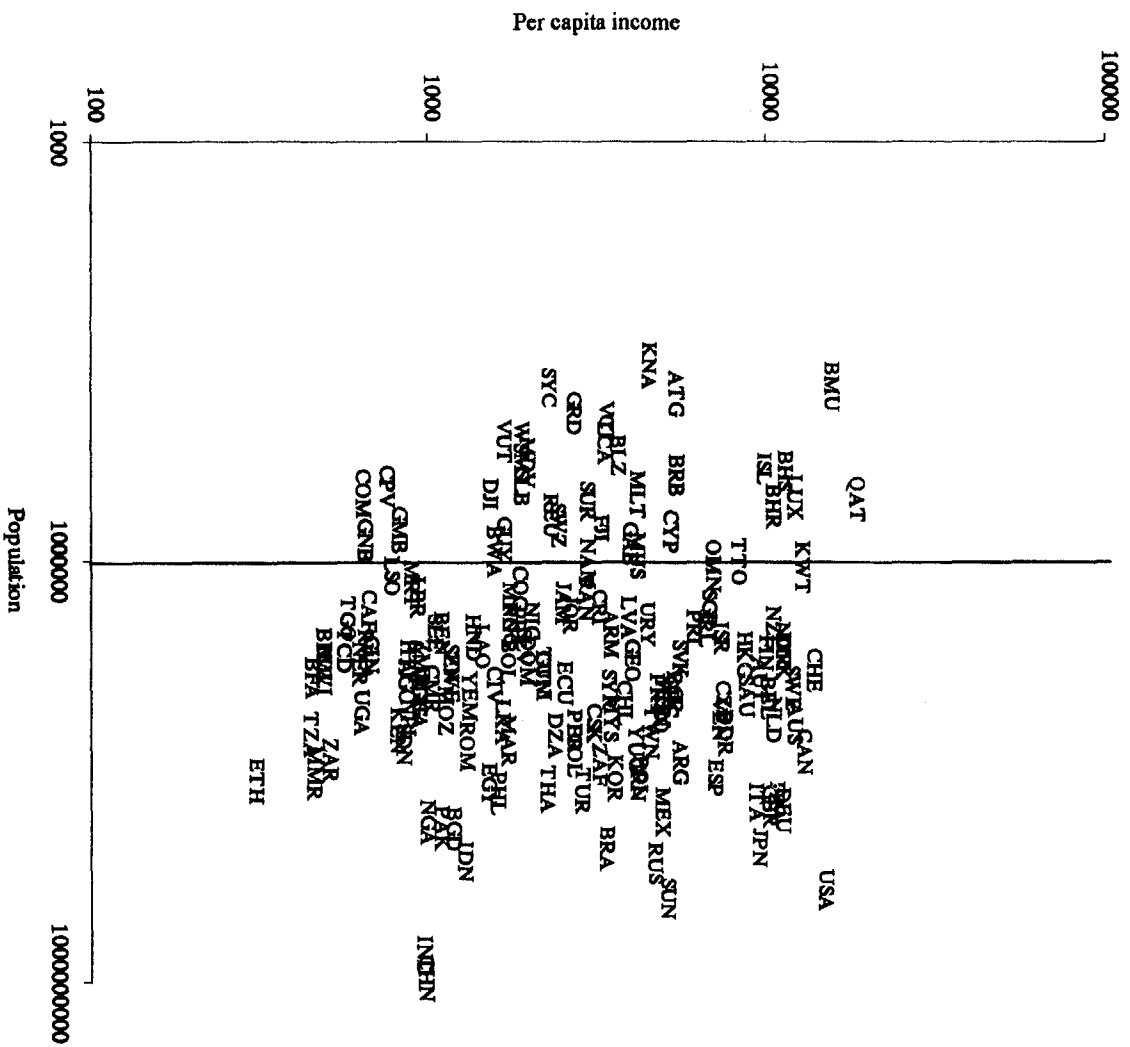


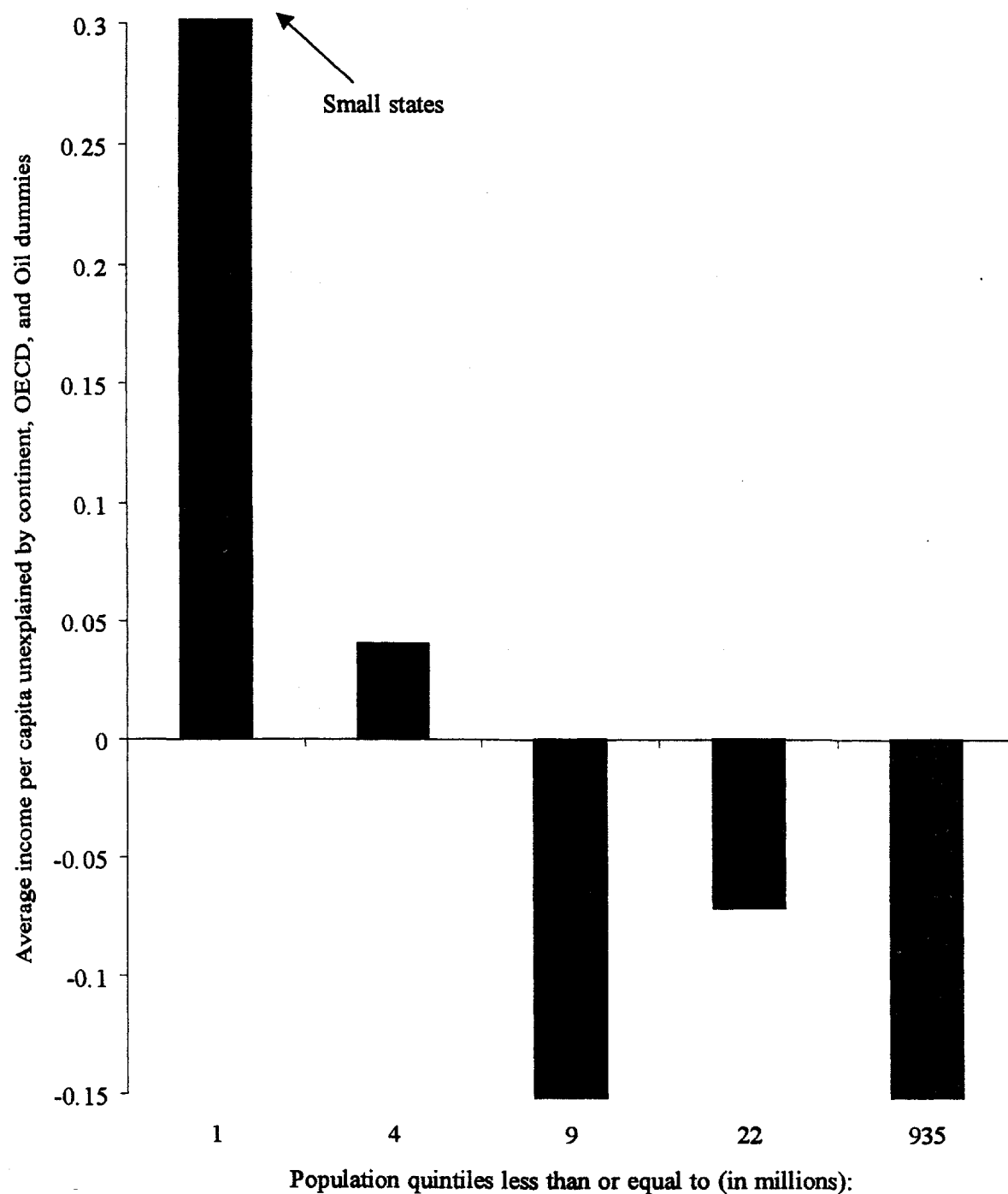
Figure 2: Unexplained income level and population size

Figure 3: Per capita growth and change in MRW steady state income, small states

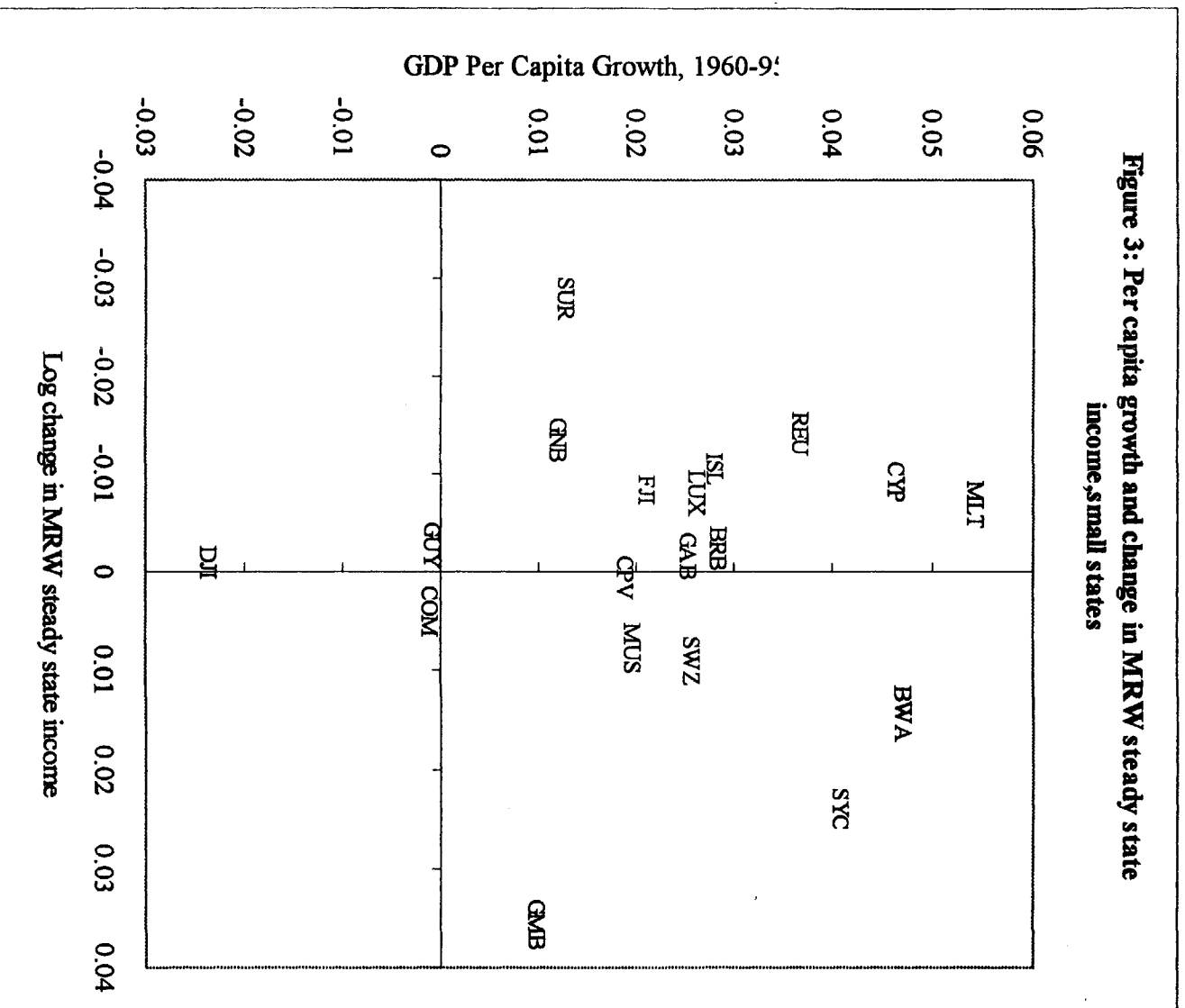


Figure 4: Predicted Income in Guyana from Solow/MRW model and actual income

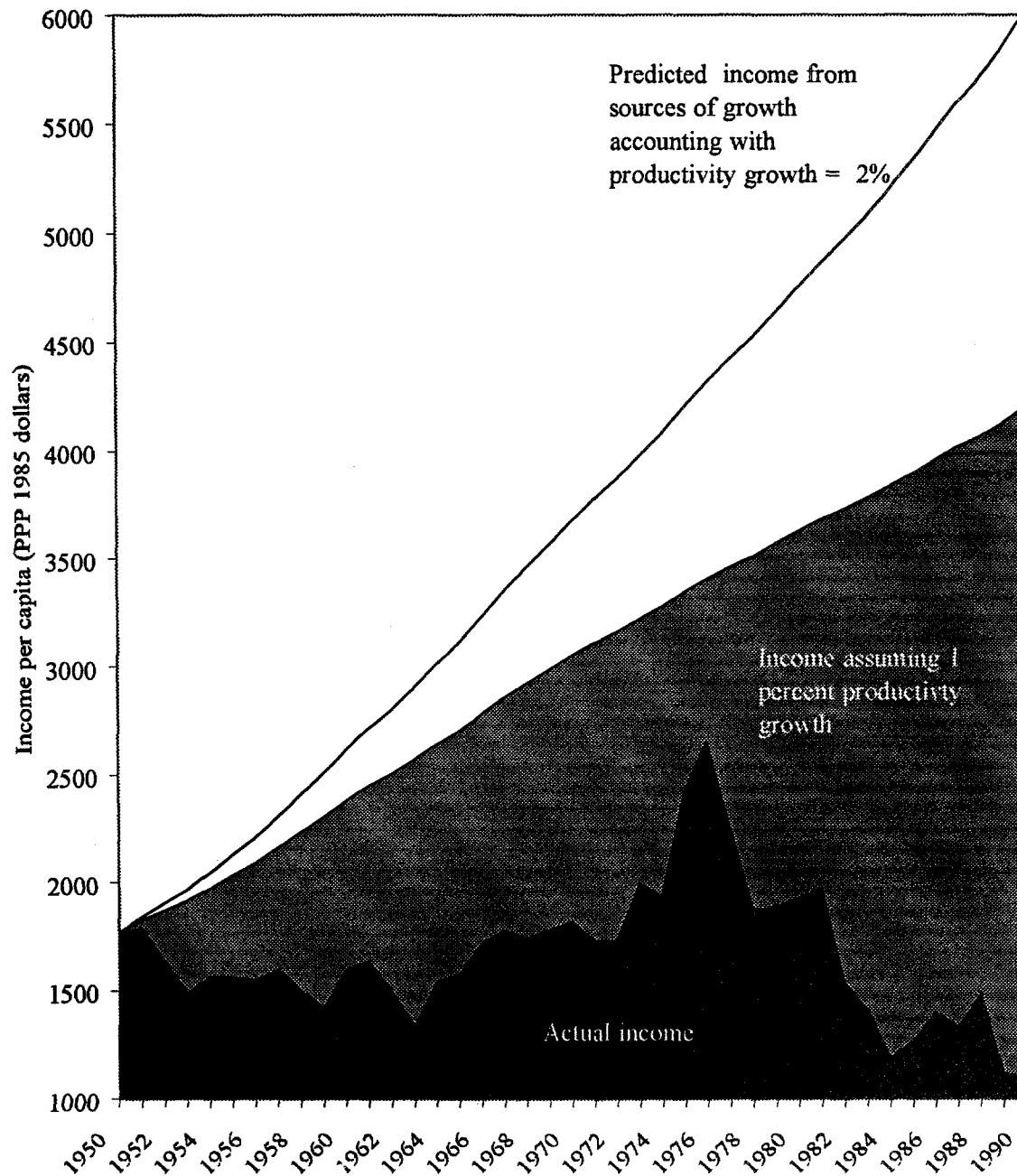
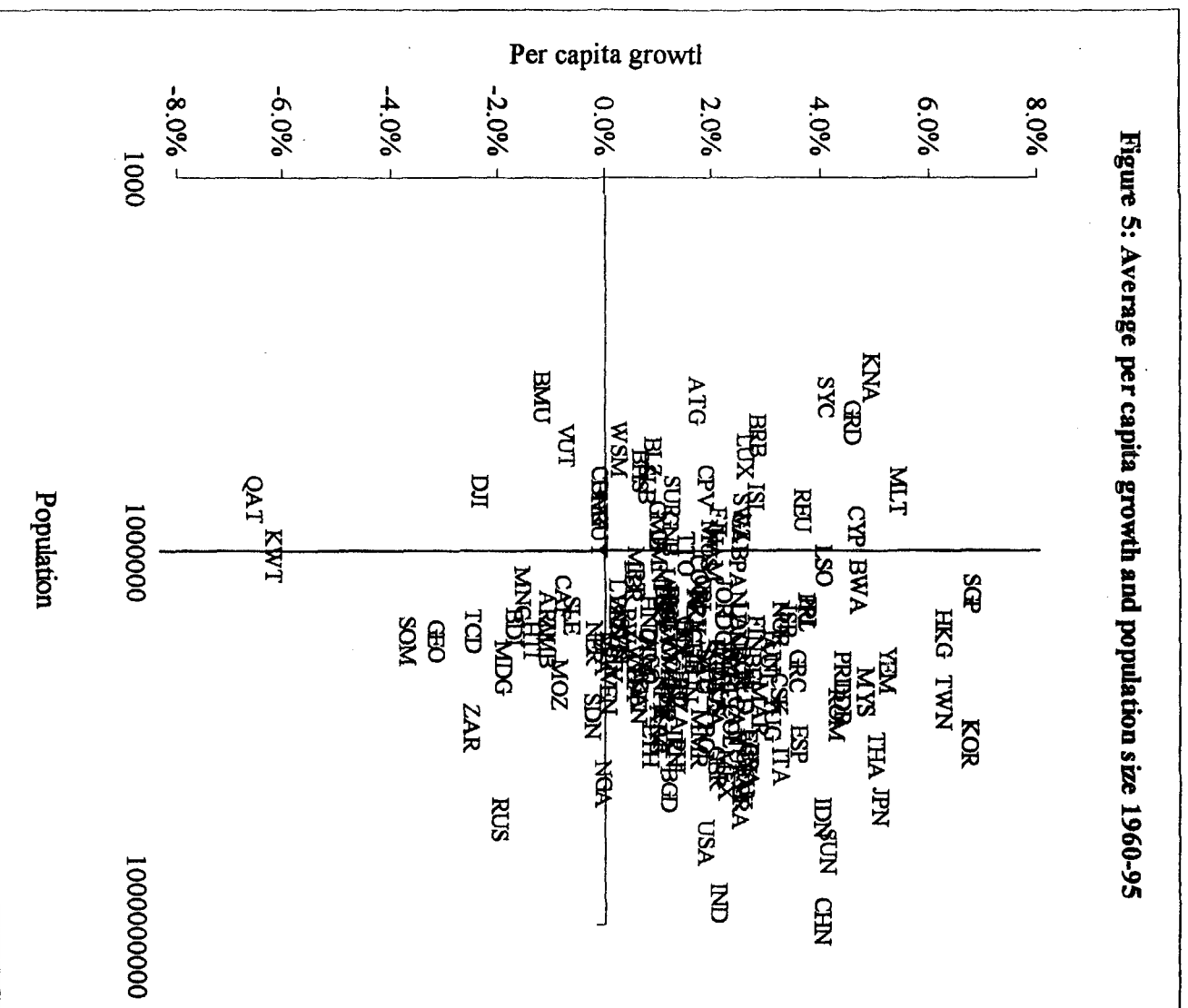


Figure 5: Average per capita growth and population size 1960-95



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